## 1. R as a Calculator (for Scalars)

| Command | Meaning | Example |
|---|---|---|
| Arithmetic: | | |
| `x [+-*/^] y` | $x+y, x-y, xy, x/y, x^y$ | `7 / 3, 8^(1/3)` |
| `x %/% y` | integer division | `7 %/% 3` |
| `x %% y` | modulo (remainder) | `7 %% 3` |
| Calculator functions: | | |
| `exp()` | exponential | `exp(1)` |
| `log(x, base = exp(1))` | logarithm | `log(9, base = 3)` |
| ("=" indicates default) | | `e = exp(1); log(e^2)` |
| `cos(), sin(), tan()` | trigonometry | `sin(pi/2)` |
| `sqrt()` | square root | `sqrt(9)` |
| Other easy functions: | | |
| `abs(x)` | absolute value | `abs(-3)` |
| `floor(x)` | greatest int $\leq$ x | `floor(-1.5)` |
| `ceiling(x)` | smallest int $\geq$ x | `ceiling(-1.5)` |
| `round(x, digits = 0)` | round to #decimal places | `round(4/3, 2)` |
| `signif(x, digits = 6)` | round to #significant | `signif(4/3, 2)` |
| Statistics distributions: | | |
| `dnorm(x, mean = 0, sd = 1)` | $f(x)$ | `dnorm(0)  # density` |
| `pnorm(q, mean = 0, sd = 1)` | $P(X \leq q)$ for $X \sim N$(mean, sd) | `pnorm(-1, 0, 1)  # probability` |
| `qnorm(p, mean = 0, sd = 1)` | $x$ with $P(X \leq x) = p$ | `qnorm(.16, 0, 1) # quantile` |
| `rnorm(n, mean = 0, sd = 1)` | random from $N(0,1)$ | `rnorm(1, 7, .01) # random` |
| `[dpqr][t,chisq,f,binom]()` | other distributions | `?pt`, `pt(-2, 100)` |
| Miscellaneous: | | |
| `?name` | `help("name")` | `?pt` (help includes Description, Usage, Arguments, Value, Examples) |
| `??topic` | `help.search("topic")` | `??deviation` |
| `<-` (or `=`) | assign variable | `x <- 3` (or `x = 3`) |
| `variable.name` | `print(variable.name)` | `x` |
| `ls()` | list variables | |
| `rm(list = ls())` | clear all variables | |
| `list.files()` | list all files | |
| `#` | comment rest of line | `N <- 3 # number of points` |
| `quit()` | quit R | |
| `demo(topic)` | run demo code | `demo("graphics"), demo("plotmath")` |
| `source(file)` | read code from `file` | `source("quiz1.R")` |
| `setwd(dir)` | set working directory | `setwd("C:/Users/jg/Desktop/327")` |
| Shortcuts | | Help > Keyboard Shortcuts |
| ... | | |
| $\uparrow, \downarrow$ (up-, down-arrow) | previous command, next | |
| `Esc` | interrupt current command | |
| ... | | |